

Introduction

Overview

This report, the 11th in a series of biennial publications, documents both short- and long-term trends in the participation of women, minorities, and persons with disabilities in science and engineering education and employment. The reports are mandated by the Science and Engineering Equal Opportunities Act (Public Law 96-516).

The primary purpose of this report is as an information source; it offers no endorsement or recommendations on policies or programs. The previous edition of this report (NSF/SRS 2000) examined changes in participation since the first report in the series was released in 1982. That report found that many of the findings of the 1982 report continued to be the case in 2000. Among these trends are the relatively small percentages of women and minorities who earn S&E degrees and who are employed in S&E, the concentration of women and minorities in specific fields, the higher rates of part-time employment and unemployment for women than for men, the lower salaries earned by women than by men, the lower salaries earned by minorities than by whites, and the lower percentages of women than of men in full professorships. The first *Women and Minorities in Science and Engineering* report in 1982 did not present data on persons with disabilities, thus no changes between 1982 and 2000 in participation of persons with disabilities were reported in the 2000 report. Each report in the series since 1982 has included some data on this population.

The current report focuses on several new concerns—the “digital divide,” international differences in participation of women in S&E, the decline in male enrollment, growth and diversity in the Asian population, and changes over time in definitions of disability and differences in definitions among sources. This report also examines the specific concerns addressed in the immediately preceding report to see if they are still relevant and looks at changes that have occurred over the past decade in participation of women, minorities, and persons with disabilities in S&E education and employment.

Organization of this report

This report is organized into six chapters. The first five examine differences between men and women, among racial/ethnic groups, and between persons with and without

disabilities in five areas of S&E education: precollege education, undergraduate enrollment, undergraduate degrees, graduate enrollment, and graduate degrees. The sixth chapter examines S&E employment.

Data in this report are presented by sex, by race/ethnicity, and by disability status. Where possible, data are disaggregated further—e.g., by Hispanic subgroup, by sex and race/ethnicity jointly, by disability status and sex, by disability status and race/ethnicity—in order to present a more complete picture of participation in S&E education and employment. Where relevant, data are disaggregated by such variables as socioeconomic status and teacher qualifications to better understand the factors related to participation in science and engineering.

Racial and ethnic categories

In October 1997, the U.S. Office of Management and Budget announced new governmentwide standards for the collection of data on race and ethnicity (published as U.S. OMB 1999). Previously, racial/ethnic groups were identified as white, non-Hispanic; black, non-Hispanic; Hispanic; Asian or Pacific Islander; and American Indian or Alaskan Native. Because the old standards were in effect when the data for this report were collected, the racial/ethnic groups described here are designated by the old standards. In the text, these groups are referred to as white, black, Hispanic, Asian, and American Indian, respectively. Where data collection permits, subgroups of the Hispanic population are identified (e.g., Mexican, Puerto Rican).

In chapters 2 to 5, data by race/ethnicity are generally presented for U.S. citizens and permanent residents only. This is because some of the underlying surveys do not collect race/ethnicity data for people with temporary visas. In chapter 6 (which covers employment), the data by race/ethnicity are for all individuals, including those on temporary visas; no distinctions by citizenship are made. Less than 2 percent of employed scientists and engineers have temporary visas.

Broad demographic characteristics of the U.S. population

Data on the demographic composition of the population is often useful in comparing the relative percentages of groups (men and women, various racial/ethnic groups, and

persons with and without disabilities) participating in S&E education and employment. By way of background, text tables 1 and 2 provide data on the numbers and percentages of women, minorities, and persons with disabilities in the U.S. population by age group. In 1999, women were roughly half of the resident population of the United States. Whites were 72 percent, blacks 12 percent, Hispanics 12 percent, Asians 4 percent, and American Indians less than 1 percent of the population. Blacks and Hispanics constituted higher percentages of the younger population (those less than 25 years old) than of the older population. The U.S. Census Bureau (2001) estimates that in 1997, about 20 percent of the population had some form of disability and about 12 percent had a severe disability.

According to the latest Census projections of the U.S. population, minorities (Asians, blacks, Hispanics, and American Indians) are expected to be close to half (47 percent) of the resident population by 2050 (U.S. Bureau of the Census 2000). As of 1999, these groups constituted 28 percent of the population. By 2050, non-Hispanic whites would constitute 53 percent of the U.S. population, down from 72 percent in 1999. Due to immigration trends, the largest growth is projected in the numbers of Hispanics and Asians. Asians are projected to increase from 4 percent of the U.S. population in 1999 to 9 percent in 2050; Hispanics from 12 to 24 percent. Relatively little growth is projected for non-Hispanic blacks and American Indians; these groups would increase their representation in the total U.S. population from 12 to 13 percent and from 0.7 to 0.8 percent, respectively.

Data sources and reliability

The data underlying this report come from a number of non-Federal and Federal sources, primarily surveys conducted by the National Science Foundation's Division of Science Resources Statistics and the National Center for Education Statistics. Some of the data sources used in the report are sample surveys and therefore have differing degrees of reliability. This report states differences in comparisons of groups or in trends in the data over time only if they are statistically significant at the 95 percent confidence level (i.e., the reported difference could be due to chance only 5 or fewer times in 100). Where possible, the impact of nonsampling errors such as incomplete coverage and nonresponse has been taken into account in the report's analyses. For more information on the statistical reliability, limitations, and availability of the data presented in this report, see appendix A.

Because information may have been released since the publication of this report, see the National Science Foundation website at <http://www.nsf.gov/sbe/srs/pubdata.htm> for the most recent data available.

Availability and Comparability of Data on Persons With Disabilities

The data on persons with disabilities in science and engineering are seriously limited for several reasons, which should be kept in mind in reading this report. Operational definitions of disability vary greatly and include a wide variety of physical and mental conditions. Data about disabilities are frequently not maintained in comprehensive institutional records. Many data sources rely on self-reporting of disabilities. For these reasons, measures of disability, including numbers of persons, impacts, or services received, are likely not to be comparable across different data collections. In this respect, these data differ from other concepts where definitions meet specified and agreed-upon standards—e.g., for variables such as sex, race/ethnicity, citizenship, enrollment, fields of study, earned degrees, labor force participation or occupation—or follow generally accepted conventions—e.g., such as those for full- or part-time enrollment or employment.

Readers should be particularly attentive to technical characteristics of any data on persons with disabilities. It is essential to ascertain how those persons were identified (e.g., self-report, registered to receive services); what conditions or needs were identified as disabilities; and how measures of disabilities, or the severity or impact of the disability, were determined.

It is particularly important to be cautious in comparing incidences of disability reported by different surveys. Differences in definitions, survey respondents, and methodologies may exceed real differences and hence lead to incorrect conclusions.

This report draws from multiple data sources in discussing persons with disabilities and their participation in S&E education and in the workforce. Each chapter includes notes describing in general the sources of data for persons with disabilities. Appendix A includes a detailed discussion of the data sources and the questions used to obtain the information.

Text table 1

Resident population of the United States, by sex, race/ethnicity, and age: 1999

Sex and race/ethnicity	Total	Age														
		Less than 5	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–74	75 and older
Number (in thousands)																
Total.....	272,691	18,942	19,947	19,548	19,748	18,026	18,209	19,727	22,545	22,268	19,356	16,446	12,875	10,514	18,218	16,321
Male.....	133,277	9,683	10,208	10,012	10,151	9,183	9,055	9,771	11,216	11,039	9,501	7,998	6,183	4,968	8,199	6,112
Female.....	139,414	9,259	9,739	9,537	9,597	8,843	9,154	9,956	11,329	11,229	9,856	8,448	6,693	5,546	10,020	10,211
White.....	196,049	11,871	12,749	12,913	13,117	11,903	12,159	13,508	16,157	16,482	14,702	12,898	10,226	8,372	14,945	14,046
Asian/Pacific Islander.....	10,186	836	810	763	765	717	846	888	900	856	731	575	407	323	471	298
Black.....	33,092	2,603	2,961	2,926	2,891	2,556	2,475	2,522	2,748	2,619	2,140	1,617	1,236	1,014	1,618	1,168
Hispanic.....	31,337	3,467	3,243	2,739	2,780	2,690	2,570	2,660	2,583	2,165	1,658	1,257	932	747	1,102	744
American Indian/ Alaskan Native.....	2,026	165	184	207	195	160	160	148	156	147	124	99	75	58	82	67
Percent																
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Male.....	48.9	51.1	51.2	51.2	51.4	50.9	49.7	49.5	49.7	49.6	49.1	48.6	48.0	47.3	45.0	37.4
Female.....	51.1	48.9	48.8	48.8	48.6	49.1	50.3	50.5	50.3	50.4	50.9	51.4	52.0	52.7	55.0	62.6
White.....	71.9	62.7	63.9	66.1	66.4	66.0	66.8	68.5	71.7	74.0	76.0	78.4	79.4	79.6	82.0	86.1
Asian/Pacific Islander.....	3.7	4.4	4.1	3.9	3.9	4.0	4.6	4.5	4.0	3.8	3.8	3.5	3.2	3.1	2.6	1.8
Black.....	12.1	13.7	14.8	15.0	14.6	14.2	13.6	12.8	12.2	11.8	11.1	9.8	9.6	9.6	8.9	7.2
Hispanic.....	11.5	18.3	16.3	14.0	14.1	14.9	14.1	13.5	11.5	9.7	8.6	7.6	7.2	7.1	6.0	4.6
American Indian/ Alaskan Native.....	0.7	0.9	0.9	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.4

SOURCE: U.S. Bureau of the Census, *Statistical Abstract of the United States: 2000* (Washington, DC: U.S. Government Printing Office, 2000).

Women, Minorities, and Persons With Disabilities in Science and Engineering: 2002

Text table 2

Population of the United States, by disability status and age: 1997

Disability status	Total	Age					
		Less than 15	15-24	25-44	45-54	55-64	65 and older
	Number (in thousands)						
Total.....	267,665	59,606	36,897	83,887	33,620	21,591	32,064
Any disability.....	52,596	4,661	3,961	11,200	7,585	7,708	17,480
Severe.....	32,970	2,256	1,942	6,793	4,674	5,233	12,073
Not severe.....	19,626	2,405	2,019	4,407	2,911	2,475	5,407
	Percent						
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Any disability.....	19.6	7.8	10.7	13.4	22.6	35.7	54.5
Severe.....	12.3	3.8	5.3	8.1	13.9	24.2	37.7
Not severe.....	7.3	4.0	5.5	5.3	8.7	11.5	16.9

NOTE: See appendix A for definition of "severe disability."

SOURCE: U.S. Bureau of the Census, *Americans With Disabilities: 1997*, Current Population Reports, P70-73, table 1, <http://www.census.gov/prod/2001pubs/p70-73.pdf>.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 2002

References

- National Science Foundation, Division of Science Resources Studies (NSF/SRS). 2000. *Women, Minorities, and Persons With Disabilities in Science and Engineering: 2000*. NSF 00-327. Arlington, VA.
- U.S. Bureau of the Census. 2000. *Statistical Abstract of the United States: 2000*. Washington, DC: U.S. Government Printing Office.
- . 2001. *Americans With Disabilities: 1997*. By J. McNeil. Current Population Reports, P70-73. <http://www.census.gov/prod/2001pubs/p70-73.pdf>.
- U.S. Office of Management and Budget (U.S. OMB). 1999. *Draft Provisional Guidance on the Implementation of the 1997 Standards for the Collection of Federal Data on Race and Ethnicity*. <http://www.whitehouse.gov/omb/fedreg/ombdir15.html>.